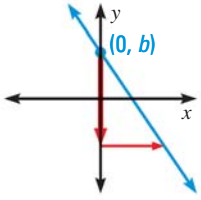
CONCEPT SUMMARY *For Your Notebook*

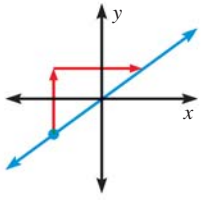
How to Write Equations in Slope-Intercept Form

Given slope m and y-intercept b



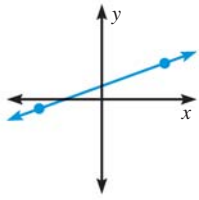
Substitute m and b in the equation $y = mx + b$.

Given slope m and one point



Substitute m and the coordinates of the point in $y = mx + b$. Solve for b. Write the equation.

Given two points



Use the points to find the slope m. Then follow the same steps described at the left.

MODELING REAL-WORLD SITUATIONS You can model a real-world situation that involves a constant rate of change with an equation in slope-intercept form.

TAKS

EXAMPLE 4 TAKS REASONING: Multi-Step Problem

GYM MEMBERSHIP Your gym membership costs $33 per month after an initial membership fee. You paid a total of $228 after 6 months. Write an equation that gives the total cost as a function of the length of your gym membership (in months). Find the total cost after 9 months.

Solution

STEP 1 **Identify** the rate of change and starting value.

Rate of change, *m*: monthly cost, $33 per month
Starting value, *b*: initial membership fee

STEP 2 **Write** a verbal model. Then write an equation.

Total cost	=	Monthly cost	·	Number of months	+	Membership fee
C	=	33	·	t	+	b

STEP 3 **Find** the starting value. Membership for 6 months costs $228, so you can substitute 6 for t and 228 for C in the equation $C = 33t + b$.

$228 = 33(6) + b$ **Substitute 6 for *t* and 228 for *C*.**

$30 = b$ **Solve for *b*.**

STEP 4 **Write** an equation. Use the function from Step 2.

$C = 33t + 30$ **Substitute 30 for *b*.**

STEP 5 **Evaluate** the function when $t = 9$.

$C = 33(9) + 30 = 327$ **Substitute 9 for *t*. Simplify.**

▶ Your total cost after 9 months is $327.